Exemption No. 6179

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of

CESSNA AIRCRAFT COMPANY.

for an exemption from § 25.571(e)(1) of the Federal Aviation Regulations

Regulatory Docket No. 28294

GRANT OF EXEMPTION

By letter L178-61-95-1155 dated July 20, 1995, Rex D. Hamilton, Executive Engineer, Cessna Aircraft Company, One Cessna Boulevard, P.O. Box 7704, Wichita, KS 67277-7704, petitioned for an exemption from the four-pound bird strike requirement of § 25.571(e)(1) from V_C at sea level to 8,000 feet in favor of V_C at sea level or 0.85 V_C at 8,000 feet, whichever is greater.

Section of the FAR affected:

Section 25.571(e)(1) requires that the airplane be capable of successfully completing a flight during which likely structural damage occurs as a result of impact with a four pound bird at V_C at sea level to 8,000 feet.

Related Sections of the FAR

Section 25.631 requires that the empennage be capable of continued safe flight and landing after impact with an eight-pound bird at V_C at sea level.

Section 25.775 requires that the windshields directly in front of the pilots must withstand, without penetration, the impact of a four-pound bird at V_C at sea level.

ANM-95-043-E

The petitioner's supportive information is as follows:

"In accordance with the provisions of 14CFR 11.25, it is by this letter that The Cessna Aircraft Company respectfully desires to submit our request for an exemption to the requirement of 'V_C at 8,000 feet' in 14CFR 25.571(e)(1) for our new Model 750 Citation X (ten) presently undergoing development and certification."

"Cessna's reasons for seeking exemptive relief from the 'V_C at 8,000 feet' provision in 14CFR 25.571(e)(1) include the following:

"The current wording of FAR 25.571(e)(1) dealing with discrete source damage requires continued safe flight and landing after impact with a 4 pound bird at design cruising speed (V_C) at altitudes from sea level to 8,000 feet.

"Reference is made to a letter dated December 9, 1992 from Mr. Ronald T. Wojnar, Manager, Transport Airplane Directorate, ANM-100, to ACE-100, ANE-100, AIR-100, and ASW-100, in which clarification is made with respect to the intent of the FAA's requirement for birdstrike criteria. Specific statement is made in the third paragraph of the Dec. 9 letter, 'The FAA did not intend to make the bird strike criteria more stringent at altitude.'

"The FAA's intent is stated more clearly in §§ 25.631 and 25.775 as the velocity of the airplane, relative to the bird along the airplane's flight path, equal to V_C at sea level.

"It is desired to obtain exemptive relief from the damage-tolerance (discrete source) evaluation standards set forth in § 25.571(e)(1) for impact with a 4-pound bird at V_C at 8,000 feet. Such a request is predicated upon the following rationale.

"1. As stated by the FAA in their letter dated December 9, 1992, 'Bird impact energy is proportional to the square of true airspeed, not equivalent or indicated airspeed....The same equivalent airspeed at 8,000 ft. yields about a 13% increase in true airspeed over that at sea level.'

"2. Also stated in the same letter, 'The FAA did not intend to make the bird strike criteria more stringent at altitude.' Therefore, the current requirement as written does not agree with the FAA intent."

DESCRIPTION OF THE AIRPLANE TO BE COVERED

"The Cessna Model 750 is a twin jet engine, swept wing, executive transport, with a design maximum takeoff weight of 34,500 pounds, and V_{MO}/M_{MO} of 350 knots/Mach .92. It is powered by Allison AE 3007C turbofan engines with a maximum sea level takeoff thrust rating of 6400 pounds. The certification basis for the Model 750

is Part 25 of the Federal Aviation Regulations effective February 1, 1965, as amended by 25-1 through 25-74, plus 25.1316 as amended by 25-80, Part 34 of the Federal Aviation Regulations effective September 10, 1990, plus any amendments in effect on the date of type certification, Part 36 of the Federal Aviation Regulations effective December 1, 1969, as amended by Amendment 36-1 through the amendment in effect on the date of type certification plus the Noise Control Act of 1972. In addition, certification to the Joint Requirements of the Joint Aviation Authorities (JAA) in accordance with the provisions of JAR-25 including Amendments 90/1, 91/1, and 93/1 has been requested."

EXTENT OF THE REQUESTED REGULATORY RELIEF

Relief is sought to permit use of V_C at sea level or 0.85 V_C at 8,000 feet, whichever is greater, in lieu of the current § 25.571(e)(1) requirement to test from V_C at sea level to V_C at 8,000 feet.

PUBLIC INTEREST

"By the grant of this exemption, the requirements for protection from birdstrike become consistent with the stated intent of the FAA not to make the birdstrike criteria more stringent at altitude (ref. FAA letter dated December 9,1992).

"The granting of this exemption would also be consistent with the bird impact speeds stated in related requirements, §§ 25.631 and 25.775."

A summary of Cessna's petition was published in the Federal Register on August 23, 1995 (60 FR 43835). No comments were received.

The FAA's analysis/summary is as follows:

The petitioner has requested relief from the four-pound bird strike requirement of § 25.571(e)(1), which requires that the airplane must be capable of successfully completing a flight during which likely structural damage occurs as a result of impact with a four pound bird at V_C (the design cruising speed) at sea level to 8,000 feet. The original bird strike provision was adopted by Amendment 25-45 and required the bird impact to be at likely operating speeds from sea level to 8,000 feet. The term "likely operating speed" was open to interpretation and causing confusion, so the FAA proposed a revision that would have required a specific structural design speed. The proposal was published on December 3, 1984, as Notice 84-21 (49 FR 47358). The FAA proposed a single speed of V_C at sea level, which was consistent with other bird strike requirements in §§ 25.631 and 25.775. One commenter to the proposal pointed out that an artificially low value of V_C at sea level could be established for the sole purpose of reducing the bird impact speed. This would lead to unconservative impact airspeeds

at lower altitudes where bird impacts are most likely. The FAA agreed and revised the final rule accordingly.

Most airplanes, except those with an artificially low V_C at sea level, have a near constant value of V_C KEAS from sea level to 8,000 feet. The same equivalent airspeed at 8,000 feet gives about a 13 percent increase in true airspeed above that at sea level. In Amendment 25-72, the FAA did not intend to make the rule more stringent at 8,000 feet than at sea level. The intent was to prevent an applicant from selecting an unrealistic value of V_C at sea level.

In conclusion, the FAA has determined that the design cruising speed (V_C) schedule of the Cessna Model 750 meets the intent of the regulations with respect to the bird impact velocities defined in § 25.571(e)(1), as amended by Amendment 25-72.

In consideration of the foregoing, I find that a grant of exemption is in the public interest and will not affect the level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 USC 40113 and 44701, delegated to me by the Administrator (14 CFR 11.53), Cessna Aircraft Company is hereby granted an exemption from the bird impact speed requirement of § 25.571(e)(1) of the Federal Aviation Regulations, to the extent necessary to permit certification of the Cessna Model 750 using V_C at sea level, or .85 V_C at 8,000 ft., whichever is greater.

This exemption will remain in effect unless superseded or rescinded.

Issued in Renton, Washington, on October 5, 1995

Gary L. Killion
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service, ANM-100